The MAC Flyer

MAY 1973

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For Greater Efficiency in MAC Air Operations

The MAC Flyer

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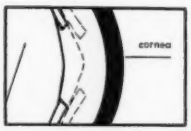

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COVERS: Big airlift demands big engines. The size of the TF-39 is hard to comprehend until two young ladies grace the inlet.

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Squawk Box

Over the years, we have poked a bit of fun at the mistakes of others. Many of the goofs were made by a group now embracing retirement — the men who built MAC. They won their wings in the command's fledgling Air Transport days, grew with it through the joint-service MATS era, and brought it to its ultimate military airlift capability as MAC.

These men who built MAC contributed war stories and mishap lessons because they had the experiences of pioneers. Trial and error was their only school, and they knew it cost too much. They began flying in open-cockpit trainers when one accident each thousand hours was common. They stood at gravesides as not-so-old comrades were laid to rest, and they resolved that they would do all possible to prevent such needless waste.

These men leave as their legacy: the ultimate in self-enforced professionalism; a standardization program which demands each man be an optimum individual; the be-safe techniques of check and double check; and the best accident rates in flying today — better than ever before, better than anyone else's in USAF, and better even than that of our brothers in civil aviation.

We of the next generation wish them well as they start to swap their flying suits for civilian attire. They served long and well; they learned the hard lessons; they asked the tough questions; and they found a better way. They set up the system, enforced it, and used it to make us better.

We owe the old heads a large measure of thanks.

Somewhere at a remote site, a chopper crew faces maintenance troubles and sunset.

The Heated Decision

by Maj Dennis W. Stiles, 67 ARRSq

1615 — Hot! The air in the tent is thick and moist with an almost living smell, like the trapped breath of some huge animal, and outside streams of heat quiver up a hundred feet or so off the oil barrels and the helicopter blades before they dissipate into the general brightness. Palmer set a wrench down in the sun for half an hour and burned his fingers when he picked it back up. Burns is asleep with his mouth open. He looks sick with sweat. I have a fierce itch wandering up and down my back, and a fly that's fallen in love with my right ear. Heat and red dust! I feel stuffed and surrounded by heat and red dust. I can put my little finger in my ear and work out a red dust gumball. Every smell, sight, touch — every awareness has some component of muggy heat. Even the water in the cooler tastes hot and stale, with that flat hint of corroded tin that sticks to the roof of your mouth worse than peanut butter. Better to chew a weed.

Heated Decision

If Palmer doesn't fix that transmission seal and we miss our alert rotation and have to stay another day, I'll be nuts. I'll be nuts in another day!

1630 — Palmer says he'll need another hour. I look at my watch, crank up the APU, and call weather. Weather says possibility of evening thunderstorms along the ridges and possibility of heavy ground fog building in the valleys after sunset. Possibility! Possibility of snow if the north pole moves south. I wake Burns up for want of something better to do. Burns is a second lieutenant. He acts guilty for sleeping or scared that he's missed something. He follows me around to see if there's anything he can do. Eager! I wish I'd let him sleep. How soon can we make it off, he wonders. He reminds me that we'll keep our forward alert another day if we don't get back to Site 9. If we don't make it off for an hour, we can't get to Site 9 before sunset, he observes. If we can't get to Site 9 before sunset we can't land there, he remembers. He quotes the OI, trying to be helpful, while I paw at the itch between my shoulder blades. I feel like I just climbed out of an oat bin. Burns considers with me that Site 9 has an unlighted runway. I try to imagine the first sting of a cold shower and a full swallow of Coke. I look at my watch again.

1700 — A first hint of breeze. The natives start coming around. A lady wants to trade me a cucumber for a safety pin. Okay. Pretty soon she comes back with two more ladies, and I try out all my dramatic arts trying to explain in signs that I don't have any more safety pins. They looked disappointed and unfriendly. One of them, an old one, spits on the ground before she walks away. A kid comes leading a fat rat, nearly black, on a long piece of dirty string. I ask him in French if there are many rats here. He makes a generous sweep of his hand over the horizon. Partout, he says. Everywhere. T'en veux un? You want one? His rat is nibbling around my boot, and I look nervously at the cots in the tent. Maybe a foot and a half off the ground. I remember the rustling and skittering noises in the night. No thanks, kid, I say in English. I wave and try to wander casually off. The kid follows me. Finally Burns wraps a bandaid around the kid's thumb, and he scampers back to the village. I stand and watch Palmer, who ignores me and cusses steadily under his breath. His hand is bleeding where he has scraped his knuckles.

1730 — Palmer finishes up. He looks happy for the first time all afternoon. I look at my watch and suck on a tooth. If we take off in five minutes, we'll get back to Site 9 just about twenty minutes after sunset. I try to remember how dark it is twenty minutes after sunset and can't. The strip at Site 9 is light red, dusty. Sometimes it looks almost white in the moonlight. I scratch my neck and then pick the ridges of sweaty dirt out from under my nails. I look at the water can. I can look at the flat plain of rice paddies leading like checkerboard squares into the jungle and remember the rats. I look at Palmer scurrying around to get his tools away. I pretend to myself to make a decision I've already made. C'mon, Burns, I say, let's do it. He grins trustingly and looks quickly at his watch.

1740 — We lift off. I take it straight up from the parking area to save time, and blow over three wicker cages full of chickens. Feathers dance along with us in the cloud of red dust. A native scorches me with a stare. Burns looks at the instruments, carefully pretending not to notice. I pull in max power and roll the nose over, getting 105 knots. Not as much as I'd hoped. I look at my watch.

1820 — Ten minutes out of Site 9, and I am starting to sweat, literally. I feel a thin trickle work down from my armpit and across my ribcage. Below us, gentle white rivers of ground fog are flooding the valley floors, building up earlier than usual, laying the jungle to rest. Ground team at the site has just called to let us know the strip is obscured from the north and west. Push on around and try to work up from the south, they say. And snap it up! It's working in here pretty fast. I glance at Burns. He's looking innocent as a saint. Darkness is pushing hard into dusk.

1830 — I'm over the site, I can tell from the ridge pattern, but I can't see the strip, which is hidden by the fog flow. Ground team calls that they hear us and that they've set burning oil drums along both sides of the runway. I start to feel confident again. The stuff is still thin, and too pretty to be dangerous. On top it's calm and smooth, like floating. I could fly forever. I set myself up an approach from the south and feel good.

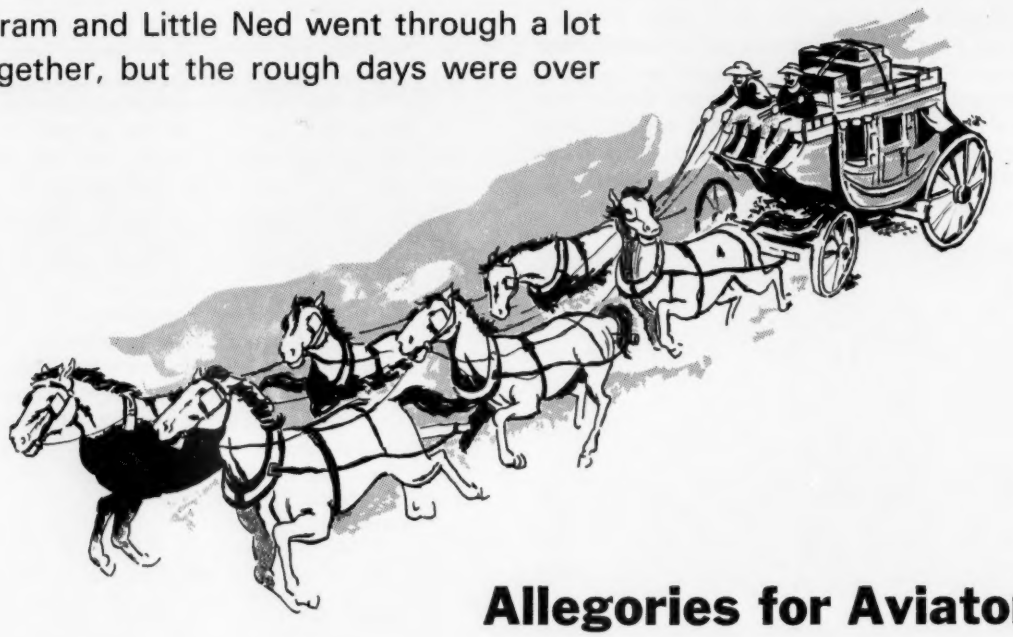
1835 — We slide into the fog. Everything starts going faster, and I feel a little confused. Burns is leaning ahead like a setter on the point, staring out and holding onto the console border. I notice that his knuckles are white. I bring my airspeed down to 40 knots and watch my altitude hard. The valley is deep and narrow, and I'm sweating the ridges. I remember that my itch is gone and I almost laugh. Then I see a light off at two o'clock. I swing gently toward it. I'm maybe two hundred off the ground. I see another light at eleven o'clock, and I'm really confused. I'm on a runway heading but I'm not lined up straight with the runway! Then there are lights all over the place, flickering dimly like candles seen through gauze, and I remember the campfires. There are campfires all over the village, and I can't tell the campfires from the oil drums. I nearly panic. I want to push the thing on down and take the consequences, anything just to get out of the air. Get on the controls with me, I tell Burns; just monitor close. We're climbing out. We break clear at 700 feet. Solid dark. I reached up automatically and tug at my chute straps.

1850 — I'm circling just to the south. Ground team says turn on your landing light. I hear a background cheer. We can see the glow of your light, they say. You're about two miles to the south southeast. We'll talk you down from here. We've set up a jeep at the departure end of the strip. He'll flash his lights. Why didn't you think of that? I asked Burns, proud for having tapped some undrainable well of sarcastic humor. Burns doesn't say anything. I fly the headings the ground team calls and start another approach. The fog swallows us again.

1855 — On the ground. My flight suit is soaked and my legs are shaky, exhausted. I trade a few quips with the guys who cluster around and then go to bed quickly, without a shower.

2100 — Burns asks me if I'm asleep. I'm not. I guess we shouldn't have tried it, huh? He says. I don't much want to talk about it, but it works at my mind. We learned something, maybe, I say. You're lucky to learn it so soon, earlier than I did. I don't know, he says, it was a hard decision. He is anxious to be forgiving. Naw, I say, feeling wise, it was an easy decision. I just blew it. I got go-homeitis. I got it bad. You remember not to get it, not even over here. Especially not over here! Yessir, he says profoundly. I feel better, purified by confession. I get up and trot to the shower in my scivvies, feeling older than I did a day ago, even an hour ago.

Hiram and Little Ned went through a lot together, but the rough days were over



Allegories for Aviators

A Visit with the Soldiers

At the opposite end of the safety education spectrum from pulpit-pounding exhortation to fly safe! is another genre, the parable. We have called our sporadic efforts in this area "allegories for aviators," and in them we have purposefully avoided both an aviation setting and specific mention of safety. These stories are aimed at the segment of our readership that skips over traditional material but will dig into something more novel or challenging. The moral in this one: don't let your guard down just because part of the risk is gone.

Hiram Hickabee had always been a bit leery of Little Ned Rossman, though he'd sure been glad to have him along on most of these trips. The company had hired Ned after Hiram lost his first partner over a year ago, and it took Hiram quite a while to get accustomed to the taciturn little man. They'd never talked much — not even at the turnaround station at Quartz, where there wasn't much else to do.

The only thing Hiram felt sure of was Little Ned's main joy in life — feeling his lever-action .45-70 rifle belch a lead ball at a human target, then watching as his prey slammed backward to the ground. Doggone fine guard though — eyes like a cat and the ability to smell danger.

Things had been pretty hot on some of these runs, and Little Ned had kept them both alive more times than he could count. Sitting up there all exposed to someone with a grudge and a good rifle eye wasn't Hiram's idea of the best way to make a living. But the extra pay was good, Little Ned had done his job well, and, after all, a feller had to be doing *something*.

Yes, this would probably be the last ride with Little Ned. Hiram sighed with relief and the trace of a smile lit his face. Now that the treaty had been signed, Ned would likely be moving on. The company agent had reported no action along the route for almost two weeks, and, tomorrow being payday and all, Hiram figured that Little Ned would take what he had coming and vanish. Couldn't blame him, in a way — the action was still hot farther west, and

where the risk was, the cash was. He too had thought about moving on, but not seriously. Things had gotten a trifle more interesting around Kiddsville lately, especially for an eligible bachelor. Sure was a nice family — especially the girls — that the new store owner had. Yes, sir.

Hiram hitched up the triple team and checked that the freight boxes were secure, then walked into the office to roust the passengers. "Who's going west?" he asked.

"Them three," offered the agent with a jerk of his thumb. "Two soldiers and that dude in gray. That's all."

Hiram nodded, turned to the passengers, and said, "Let's go."

Little Ned was already in place when Hiram returned. Odd, thought Hiram — he usually sits there polishing that rifle before we go, and tonight the gun's stowed and Ned looks half asleep. Yeah, things sure are calming down.

Hiram climbed to the seat, then unwrapped the reins and popped them sharply. "Hiyaa!" he bellowed, and they lurched into the night.

* * *

The first break was about three hours out, at Willow Springs. As they crested the last knoll before the Springs, Hiram was surprised to see a small fire framed on three sides by wagons.

"Lookit that!" he said, rousing Little Ned. "The fighting's over for sure, ain't it?"

Little Ned craned his head toward his driver, grunted, "Yup," and went back to staring at the horizon. As Hiram guided the teams off the road toward the water, he thought less gun and more company on these runs would be a good thing.

"Okay, we'll be here for about ten minutes," Hiram commented to the passengers as they stopped. "You wanna stretch, you go right ahead."

The three lumbered stiffly out, and the older of the two soldiers looked up at Ned still motionless on the seat. "He stuck up there?" he asked Hiram. "He was sitting there when we got on and he ain't moved yet. Anything wrong?"

"Naw," answered Hiram. "Don't worry about him. Things have been so quiet lately that he's getting bored. Don't imagine we'll see much of him after tomorrow."

"Yeah, things sure are gonna change around here now," offered the younger soldier. "And my enlistment is about up, too — might just take my mustering out pay and settle here myself."

The older one snorted in derision. "Shoot, you'll still be saying that twenty years from now — and you'll still be wearing Army blue and wondering if you'll ever make corporal."

"Listen to you talk!" shot back the younger one. "I'll be a sergeant before you even make corporal *again!*" Then, realizing he's been trapped once more, he backtracked. "That is, of course, *if* I change my mind about getting out."

Before the older one could resume his needling, Little Ned cut in. "Speaking of *getting*," he grumped, "why don't you save all that palaver and get back in. Let's get a move on."

* * *

"You wanna drive for a change?" asked Hiram when they were back on the road.

Little Ned looked across at him without a flicker of interest, then shrugged. "You're the boss," he muttered, then added, "Nothin' else to do, anyways." He took the reins.

"Well, pull up for a minute. I'll go down and visit with those soldiers."

"Yeah, you sure will." Little Ned groused as he tugged the horses to a stop.

* * *

The four in the stage swapped lies for over an hour, and even the little man in gray was drawn into the conversation. He was a clothing drummer from Chicago, the veteran of many lonely night rides, and he was looking for new opportunities in the territory. He'd done well in Kiddsville, and Hiram knew he hoped to do even better at Quartz. In fact, the drummer hinted at so much that the younger soldier was half talked into trying to start a store himself. Hiram thought it might not be a bad idea — sure would be a lot of new folks coming through now that all the trouble was over.

As they lapsed into silence, Hiram noticed Ned was slowing the stage for the long downhill pull into the valley where Quartz lay. Then he heard the shot and felt the stage sway as Little Ned toppled forward onto a rear horse and pitched to ground. Hiram swore at himself for not being up there where he belonged, swung open the door, and grabbed the seat rail. He stabbed his foot at the step above the wheel, missed, and tried again. This time his foot slipped cleanly off and got caught in the spokes. The wheel skidded briefly as it snapped his leg, tearing his grip loose and launching him headlong onto the dirt. As the unbraked stage banged the whippletrees into the third team's rear legs, adding panic to their fright, the horses began racing down the grade.

In seconds it was all over; a wheel hit a rock, scattering stage, passengers and freight down the stony slope. Two shadowy figures moved in silently, one knifing the three from the coach while the other stalked back toward Hiram and Ned.

A searing pain as a foot hit his crumpled leg brought Hiram back long enough to curse himself again. How stupid — letting his guard down just because the treaty had been signed. Then the knife flashed, and he was gone.

After a long and unusually tough flight,
what is your emotional feeling toward...

ACP: Friend or

The MAC Airlift Command Post is the nerve center of our far-flung air operations. It is also the scene of many a dramatic confrontation such as this one.

SCENE I

Enter one each MAC aircraft commander, easily recognizable by the clip board in his right hand, the cigarette in his left, the ten-hour stubble of beard on his still-youthful face, the grim set of his mouth, and the red, hollow-eyed look of a man who has seen (however briefly) death, nose to nose.

The time is 0300 local. The AC approaches a window marked "ACP Duty Officer," drops his clip board with a clatter, and leans on the counter wearily. His tired eyes take in the scene in the ACP. He notes that, as usual, no one seems to have noticed his arrival despite the deliberately loud noise his clip board made hitting the counter. The ACP officer has his back to the window and is apparently listening to someone on the telephone. An airman is lazily entering grease pencil notations on a large plexiglas status board. Three other people are grouped in the rear of the room and the AC surmises that they are (a) plotting some new way to foul up the operation (b) discussing the measurements of the new WAF clerk-typist or (c) odd-manning for coffee and doughnuts at the snack bar.

r Foe?

This particular AC is ordinarily a pretty nice guy with the manners befitting his rank. But he has just landed after an eight-hour flight across two thousand miles of very chilly, rough ocean. He has penetrated two cold fronts during the crossing, each of which required nearly an hour of the roughest kind of hand-flying, not to mention the stomach-tensing fear that things might get a lot worse before they were out of the weather. Then, two hours from landing, number three engine decided to quit running and, shortly after that, number two generator likewise gave up. To top it all off, he had to make his three-engine approach at night under ragged 300-and-2 weather. So he is just a mite miffed that he's being forced to cool his heels by this lackadaisical ACP type while his crew shivers in the unheated crew bus when all they want is a hot shower, a cold brew, and about 20 hours sack time.

Finally, his voice dripping with sarcasm, he slaps his palm on the counter and speaks, "Say, captain. Any chance of having a bit of your time before I run out of crew rest?" The duty officer, cradling the phone, looks at the AC darkly, but makes no move to approach the window and talk to him. Instead, he dials another number and again turns his back to the window.

Well, that does it! The AC was ready to be relatively civil to this guy but now all he wants to do is punch him in the mouth. It takes considerable will power on his part to refrain from doing just that when, after what seemed like half an hour but was really only a minute and 23 seconds, the duty officer puts down the phone and finally asks, "Will you accept 12 and 1½? You're behind schedule and we want to move you right out as soon as we can!"

Our hero, the AC, can only stare at him, his mouth slack-jawed with shock. After all he and his crew had just gone through and this clown wants him to take minimum crew rest! The idea is so preposterous it completely overwhelms him . . . he is speechless.

"Come on, come on" says the duty officer. "I haven't got all night. You're tying up a crew bus I need for an arrival in 30 minutes."

At this point we'll spare you the gory details of the ensuing action, though blue smoke and an acrid smell are evident for sometime thereafter. Harsh words are followed by harsher ones. Time is wasted, morale suffers, and the prospect of a truly restful ground time for the crew is utterly destroyed. In the end, the AC arbitrarily declares 24 hours crew rest "in the interest of flying safety" and stalks out in a huff. The ACP duty officer makes a note of his name and silently vows to park him at the farthest corner of the darkest ramp every chance he gets. Yet, it all could have been much different. Let's take a look at . . .

SCENE II

Enter the AC, as before. Same flight, same rough time. And it's still 0300. This time, however, the duty officer is ready and waiting at the window. Prepared ahead of time, he is smiling and has all the papers concerning this particular mission handy in a folder right in front of him. He speaks, "Good morning, Captain Jones." (Notice that he has taken the time to look up his name, thereby helping him to realize that he is dealing with a human being and not a robot.) "Guess you must be pretty tired after all your troubles on the way

Friend or Foe ?

over." (Note that he has communicated to the AC his awareness of his problems and his sympathy.) "We have you set up for fifteen hours crew rest but you can have more if you like." (Note the cooperative, understanding attitude. Already Capt Jones feels a little less tired and begins to relax.) "I'm sorry we had to park you in the boondocks but maintenance control wanted you out there for your engine change. Did crew transportation meet you okay?" (The forthcoming gripe by Capt Jones about his parking has been neatly nipped in the bud, an explanation has been supplied, and genuine interest displayed in his and his crew's welfare.)

The rest of the dialogue is similar. When Capt Jones leaves the ACP, he is almost whistling. Instead of feeling pushed around and trod upon, he feels something like a conquering hero returning to his hometown. He knows he has done a good job coping with the problems of the flight, but it is always nice to know that others know it too. The young ACP officer is an aircraft commander himself. He knows what flying is like and appreciates his performance.

CURTAIN

The difference between these two scenes is empathy . . . the ability to put yourself in the other guy's shoes or "walk in his moccasins." Around the system, you can see all kinds of AC-ACP encounters. Some are more like the action in Scene I and some favor Scene II. Most are probably somewhere in between. All could be improved if the participants would (a) know more about the other man's job and its peculiar problems and (b) exercise more understanding of same.

Between them, the aircraft commander and the ACP officer make the bulk of the daily decisions that direct the MAC mission. Yet, it is these very decisions that often lead to friction and misunderstanding. Some of this is the result of fuzzy knowledge of each other's responsibility. Let's try to clarify that a bit.

The Aircraft Commander

The AC is what you might call our on-scene, grass roots, first echelon commander. He is the guy who, in the final analysis, makes the whole system work. Because he is a specialist at the junior executive level, he is charged with a great deal of responsibility: Essentially, to see that his particular mission is completed safely and expeditiously. Everyone else in MAC, theoretically, exists only to support him in his task. Extraordinary responsibility such as this must be accompanied by extraordinary authority. The aircraft commander *has* that authority. He is authorized by Air Force and MAC directives to make any decision necessary to ensure that his flight is conducted *safely*. When such decisions conflict with other flying directives, he must explain why, but only later after he is safely on the ground. In almost every case, his actions will be supported by his commander, even though 20-20 hindsight may prove that he acted somewhat unwisely.

Most ACs of our acquaintance understand this authority and use it judiciously. But, some do not and this is where some AC-ACP relationships get a little bent out of shape. Consider for example the case where ACP calls you in flight with a diversion to an alternate base. The ACP officer is acting well within his authority and the diversion is an order, not a suggestion. The AC, however, still has the option to refuse this course of action and proceed on another, provided he can justify doing so on the basis that the former would compromise safety of flight. Similarly, the AC can be directed to land or not land as ACP deems best, but he cannot be ordered to take off when he feels safety would suffer. Either the AC or the ACP can decide on a "No Go" and, once this decision is made, ". . . it will not be dispatched until the conditions causing his refusal have been corrected or improved so that the mission can be operated safely." (MACM 55-1, para 1-6.d.)

Part of the aircraft commander's responsibility is to keep ACP informed on the status of his mission at all

times. Conflicts sometimes develop when this is not done, as when an abnormal condition exists in the aircraft which prevents it from being handled routinely. An example would be loss of pressurization, making for higher than planned fuel consumption at low altitude. This could affect many things — planned ground time, diversion to an alternate, ground handling requirements, load on the next leg, etc. There is a saying in the computer business that goes like this: garbage in, garbage out. In other words, any decision is only as good as the information on which it is based. Many an aircraft commander might find that his apparently stupid handling by ACP was at least partially caused by his failure to pass along everything ACP had a right to know. (As a sidelight, we have noted in many accident investigations that aircraft commanders seem reluctant to tell anyone on the ground anything except the bare essentials of flight progress, even though an emergency or near-emergency may exist. We don't know *why* this is so, though we have lots of suspicions. We do know that everything that affects an airplane in flight can also affect the decisions concerning it made on the ground. This is one reason the FAA now requires the AC to notify ARTC whenever any loss of navigation equipment occurs. ACP would like to know that, too, and a lot more besides.)

The Airlift Command Post Officer

Paragraph 4-1.b, MACM 55-3, says this, "Officers considered for assignment to command posts must possess knowledge of MAC operations and be able to exercise mature judgment as well as tact and discretion, under the pressure of emergency situations. They must possess the ability to direct a fast moving operation with diplomacy and finesse, and have the background and experience in MAC operations to anticipate problem areas and apply positive corrective action."

Paragraph 4-1.c continues, "Officers assigned to command posts will, in addition to possessing the required characteristics, be qualified rated personnel in flying Status Code 1 or 3. Experience as fully qualified aircraft commanders or navigators in MAC primary mission aircraft is required . . . for each type of command post listed below . . ."

The ACP officer then is just as highly qualified, selected, trained, and dedicated as the aircraft commander. He, too, is charged with vast responsibility and must make numerous momentous decisions daily. He is a coordinator par excellence and an extension of the local commander. Like the cop on the beat, he is the law in his area of responsibility.

His job, like that of the aircraft commander, is a critical one. He is the ground focal point for all the support, command, and peripheral activities associated with airlift operations. It's his job to put it all together and keep it running smoothly. To do this, he needs a great deal of cooperation from the aircraft commander as well as all the support people.

One of the most common beliefs of aircrews is that ACPs are concerned only with delay rates. As long as the airplanes keep moving, it's said, they don't particularly care who or what gets squeezed in the process. Like most criticisms this is mostly false, yet it does contain a grain of truth. *Some ACP* officers *do* treat aircrews like cattle; they *do* push missions at the expense of morale, safety, and common sense. And they expect the AC to make up for any shortcomings they might have in their planning, coordinating, and directing. (Who, for instance, takes up the slack when the aircraft doesn't come in commission at ETIC? And, who pounds the ramp when traffic goofs and has to reconfigure the load or when the weather changes and the fuel load must be altered?)

But the vast majority of the ACP officers, like aircraft commanders, are good guys who are only interested in doing a competent, workmanlike job day in and day out. Each must, however, learn to respect the other and to appreciate his working environment. The AC, for example, should realize that while he is a big gun on his own mission, he often doesn't know The Big Picture. The ACP officer does, and it's *his* job to see that each mission is integrated efficiently and safely into the picture. On the other hand, the ACP officer who fails to treat the AC as a human being, with unique and important problems, is failing to do his job effectively.

The ACP is definitely a "friend" — and the "foe" is really our human inclination to sometimes forget the other fellow's point of view and only think of our own. That goes for both the AC and the ACP officer, as well as the rest of us. The more we learn of the other's job, the more we can appreciate his problems. A harried ACP officer, beset by telephone calls from irate staff officers, deteriorating weather at the local base and alternates, perhaps an inbound DV, an inflight emergency in progress, and a staff of green or substitute personnel, can — understandably — be a trifle less than magnanimous in dealing with an AC who is demanding loudly to know why his crew bus was five minutes late. On the other side of the coin, the terrible pressures of many "routine" flights, not to mention the truly hairy ones, can make a veritable monster out of an ordinarily meek AC when he is treated like an imbecile.

The key to the whole situation is understanding and patience. Treat others as you would like to be treated. No, it's not original . . . but it's still golden advice. Try it and see.

When you need to get a good definition of a subject, you turn to a book of words and a man with ideas.

Instructor Philosophy

by Lt Col Clyde W. "Red" Lemke, MAC/DOVF

A dictionary is a history book of words, and from Webster's *New World Dictionary*, here are some words on *instructor* and *philosophy*.

"Instructor: A person who instructs; teacher." Seems simple enough. Let's look up *instruct*.

"Instruct: [L *instructus* pp. of *instruere*, to pile upon, put in order, erect] . . ." Oops. Let's look at that more closely. Since Latin is kind of old and really not much in everyday use anymore, why is it that all of us have been exposed to instructors who live up to the Latin definitions? How about the instructor who "piles upon" his students a multitude of information and procedures before they are ready for them? Obviously, his purpose must be to "put them in order." Or could it be that he is attempting to assist the student in "erecting" that age old and revered father/semi-god image that instructors seem to be prone to? In any case, they haven't gone far enough into Webster's definition, and are hung up on a really old fashioned method (the Roman Empire is gone, fellas).

A dictionary also offers more modern help, so for the benefit of those still interested, let's go on to three current definitions of instruct:

The first is: "To communicate knowledge to; teach; educate." Now that feels more comfortable. Even carries an air of respectability, doesn't it? It should. First off, you've got to be smarter than the student. Don't underestimate him.

I remember the time (here we go . . .) when I got a young Brittany Spaniel. Fine dog, good nose, and about as hardheaded as its new master. I went right out and got a dozen or so books on how to train, feed, and care for my new bird dog. One author had the gall to start right off by saying, "Before you can train your dog, you have to be smarter than he is." We know that should be easy; after all, he's a dumb animal and I'm a homogeneous sapien. Another book advised: "If the dog doesn't respond to your commands in the field and takes off on his own, go and hide from him. You feed him and provide his shelter and security, so when he can't find you, he'll worry and will pay more attention to your whereabouts and commands thereafter."

Sure enough, that's what I did. Doubled back on my own trail, cut it three or four times, and set a new world's record for the standing broad jump to clear the trail where I departed. Then I climbed two-thirds of the way up a convenient tree, and

proceeded to wait out the dumb dog. (Us homo-saps are pretty devious when we put our minds to it!)

The dog? Oh, he got tired of running around and came looking for me. He followed my trail as easily as if I'd dropped bread crumbs along the way, walked up to the bottom of the tree, looked up at me with an expression reminiscent of a baby with gas, then laid down to rest while he waited for me to stash my nuts and quit playing squirrel. I learned that he had a better nose than I gave him credit for; it was directly linked to his brain, and, because he couldn't (or wouldn't) read, he had a direct and very accurate sense of logic. I gave the dog away and took up needle point.

I often wonder how many times an instructor in the flying business, in attempting to establish the student's need to be dependent, has found himself up a tree — feeling like a squirrel, and wishing that the only witness was a dumb dog that couldn't read, write, or talk. Anyone like to join me for some needle point?

The second definition is: "To give facts of the matter; to inform." Sounds reasonably simple, but there's a catch hidden in the phrase "of the matter." The good instructor should do just that: keep the facts, the information, pertinent to what he's trying to teach.

Save that superficial stuff that you've accumulated over the years for the bar. It's interesting, of some value, and will impress your student with the depth of your knowledge and experience. In the air, it will act more as verbal FOD clogging up his feverishly working brain. It can often lead to his making an assumption that that's what you want, and it can affect how he'll perform. The result could be somewhat like what happened to the three ---------- (you fill in the blank, I'm half-Polish and proud) who went elephant hunting. On their way they stopped at a tavern and listened to tales of local duck hunters. When they finally reached their hunting camp, two of them got hernias putting out decoys.

The third definition is: "to give directions or orders." Only one word of caution here: keep them simple and make them clear. Anyone who has ever put together a child's toy while trying to follow the accompanying instructions can understand the need for this. "Hold part B against cross beam X securely, making sure that the attaching holes at ends Q and P are aligned. Now insert the two hexagonal, tapered 9/16, #5 threaded bolts and tighten securely with the left handed lock washers and quick connect snap link fasteners. CAUTION: Alignment of this part is critical. Remember to hold both ends securely while fastening the bolts with your other two free hands. (Note: Helicopter pilots do it best.)"

Okay, that's the first half of our subject. Now let's look at *philosophy* — defined by World's version of our learned friend Webster as follows:

"1. originally love of wisdom or knowledge.

"2. a study of processes governing thought and conduct; theory or investigation of the principles or laws that regulate the universe and underlie all knowledge and reality . . .

"3. the general principles or laws of a field of knowledge, activity, etc. . . .

"4. a particular system of principles for the conduct of life . . .

"5. a study of human morals, character, and behavior; hence,

"6. the mental balance believed to result from this; calmness, composure."

Now, that's some pretty heavy stuff, but take another look at it. (Caught you, didn't I? Now go back and read it for meaning.) *A love of knowledge; the study of processes governing thought and conduct; general principles for conduct; the study of human behavior; hence, mental balance — calmness, composure.* All this time you thought you were just a teacher of airplane drivers, when in reality you became a full-fledged philosopher when you made IP. Or did you? Here's a quickie for self-analysis: When was the last time you got up tight with a student and blew your cool? Haven't achieved that mental balance, calmness, and composure yet, eh? Maybe your philosophy is weak?

Now's when you're expecting me to offer that good old list of dos and don'ts, right? You know, the simplified rules for good instructors? *No way.* Not only do I want to avoid a lot of letters because of an ethnic joke, I don't feel like climbing back up in that tree and making like a squirrel facing more than an audience of one dog with gas. The Air Force and MAC have schools to teach you and books for you to learn from. They have all the expertise, I don't.

Me, I'm going to put it in my own way. All you need to be a good instructor is: the patience of Job, the wisdom of Solomon, the diction and tenacity of Demosthenes (the Greek with stones in his mouth), the physical prowess of Jim Thorpe, and the survival instincts of Harry Houdini. (Almost makes you want to run right out and buy yourself a young bird dog, doesn't it?)

Ah, yes — reminds me of the time . . .

Say brother, what's bothering you? Could it be your eyes? This article explains what happens to your eyes as you grow older.

Has Your Zoom Lens Lost Its Zip?

Have you noticed the small print they're using in the newspapers these days? Or perhaps your arms seem to be getting shorter? If so, your zoom lens may be losing some of its old zip.

Presbyopia, also known as "old-man's vision," refers to loss of *accommodation*. When a person is under forty the lens of the eye is flexible and can change its shape, especially with respect to the degree of curvature of the front surface. These changes are controlled by the ciliary muscle (figure 1). When the ciliary muscle contracts, it relaxes the tension on the ligaments holding the lens in place, the lens bulges out a little increasing the curvature of the front surface, and the eye is then adapted for *near vision*. When the ciliary muscle relaxes, tension on the ligaments is increased and the lens is flattened a little — decreasing the curvature of the front surface. The eye is then adapted for *distant vision*. In the intermediate stages of this process, the eye is adapted for *intermediate vision*. As we grow older, the lens loses its elasticity; consequently, the eye loses its power to accommodate. A child, with his marvelously flexible lens, can resolve a fly on the tip of his nose. As you get older the lens loses the flexibility and gets harder. By the time you are 40, you may be aware of some loss; by age 45, almost everyone has trouble with fine print. The deterioration is inevitable and if you are a pilot, this should concern you.

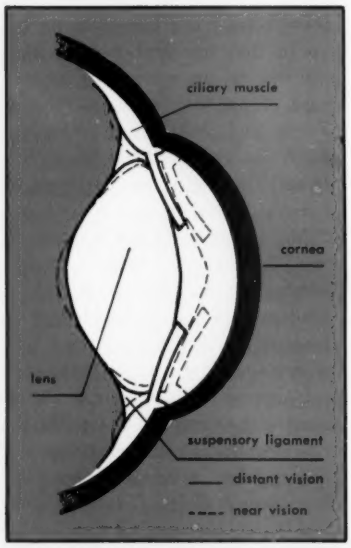


Figure 1. Accommodation depends on an elastic lens

In aviation, we are interested in three distances: near — 13 to 15 inches or lap distance; intermediate — the 30 inches to the instrument panel; and far or infinity — over 20 feet. When you're young — no problem. Your zoom lens can really zoom. This process of "zooming" is called accommodation. The near and intermediate visual skills are well within your eyes' capabilities of accommodation. When you're young, you have the acuity depicted in figure 2. As you get older, accommodation gets weaker and near vision is no longer 20/20. This elusive 20/20 (considered normal human vision) means that at a distance of twenty feet, you can distinguish characters one-third of an inch in diameter. If your vision is 20/40, you have to move up to twenty feet to see an object "normal" eyesight can see forty feet away. Now that you're older, your eyes need help in the 13-inch range; perhaps in the form of a lower reading glass segment like the bifocals or the Ben Franklin glasses. Your visual acuity remains sharp in the intermediate and far ranges since you haven't lost all of

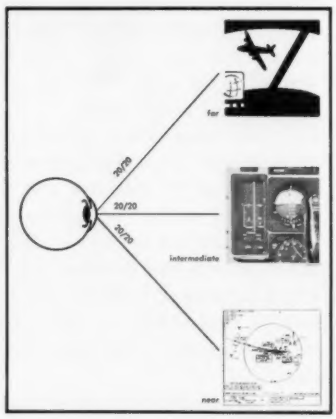


Figure 2. Normal visual acuity

your zoom accommodation. (See figure 3.)

Your new glasses may serve many years with no further problems, but

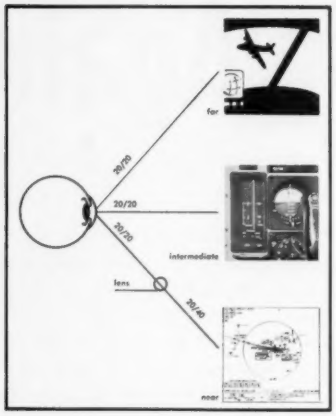


Figure 3. Correcting near vision

your eyes will continue to age. Usually by age 50, all of that old zoom is gone (sorry), and with it your intermediate accommodation. (See figure 4.) You'll probably still have 20/20 vision for the long distances, but if you don't get corrected glasses you may see fuzzy instruments on the

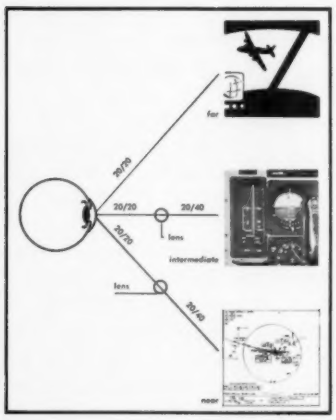


Figure 4. Correcting near and intermediate vision

panel. Accurate scanning will become more difficult and the potential for misreading the gages is increased. This combination could get you in trouble on a night IFR approach.

Sometimes the solution to the problem of old eyes is trifocals. Figure 5 illustrates normal vision restored using these additional lenses. Regard-

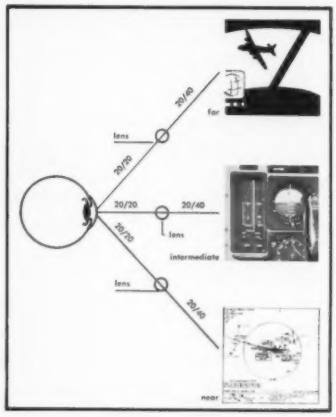


Figure 5. Correcting all three visual distances

less of the "over the hill" connotation of trifocals, they provide for all three distances you, as a pilot, are concerned with. They'll also serve to extend your safe flying career.

Think you might like the more attractive contact lenses? Well, for several reasons they are not a hot item for the flying profession. When the foreign body of glass or plastic sits on the eyeball, the cornea does not consider it acceptable company. Besides, dirt may come between the contact lens and the cornea to irritate it, and a lens falling to the floor of the cockpit would be quite unmanageable. Try as we may there seems to be no other substitute for a good pair of glasses, corrected to your present level of zoom lens capacity.

If you are over 50 and have worn corrective lenses since age 40, check with your doctor and make sure he knows your job requirements. Two suggested lens arrangements are shown in figure 6. You can vary

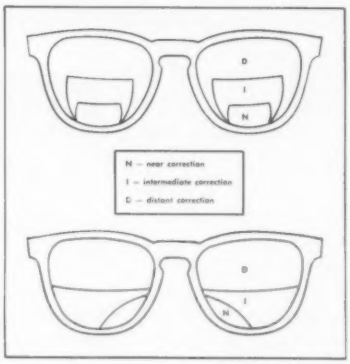


Figure 6. Two types of trifocals

these arrangements to suit yourself but the ones shown keep head movements to a minimum. Glasses particularly adapted to the cockpit will probably be miserable for prolonged reading due to the small near segment. You'll have to keep these strictly for flying glasses. Give them a try and put that old zip back in your zoom.

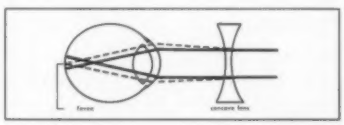


Figure 7. Correcting myopia

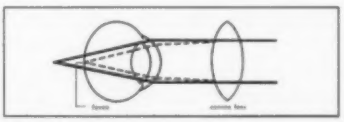


Figure 8. Correcting hyperopia

Adapted from an article by Dr. G. J. Kidera in United Airlines *The Cockpit*. Expanded by Dr. Richard Matthews, Capt MC.

The Gremlins Ride Again

by CMSgt Daniel M. Lawson

As old pros from the brown shoe days recall, many a fly-guy had his whole day ruined by invisible little imps called gremlins. Even back when wrap-around leggings were the latest fashion for the well-dressed military man, these pesky critters abounded.

Despite the lavish use of pesticides and bromides, these devils are still with us. Some of these crude characters still remove nuts from aircraft bolts and plant foreign objects in the intakes of jet engines. Others use an approach that would make Jules Verne turn green with envy — they infiltrate the mind. The results are sometimes astonishing. Let me cite a few examples:

★ A C-141 flight engineer computed a maximum takeoff gross weight of 310,000 pounds from Peterson Field in mile-high Colorado, using 90°F., no wind, no obstacle. Would you believe he was approximately 30,000 pounds in error? (The work of a gremlin, no doubt.)

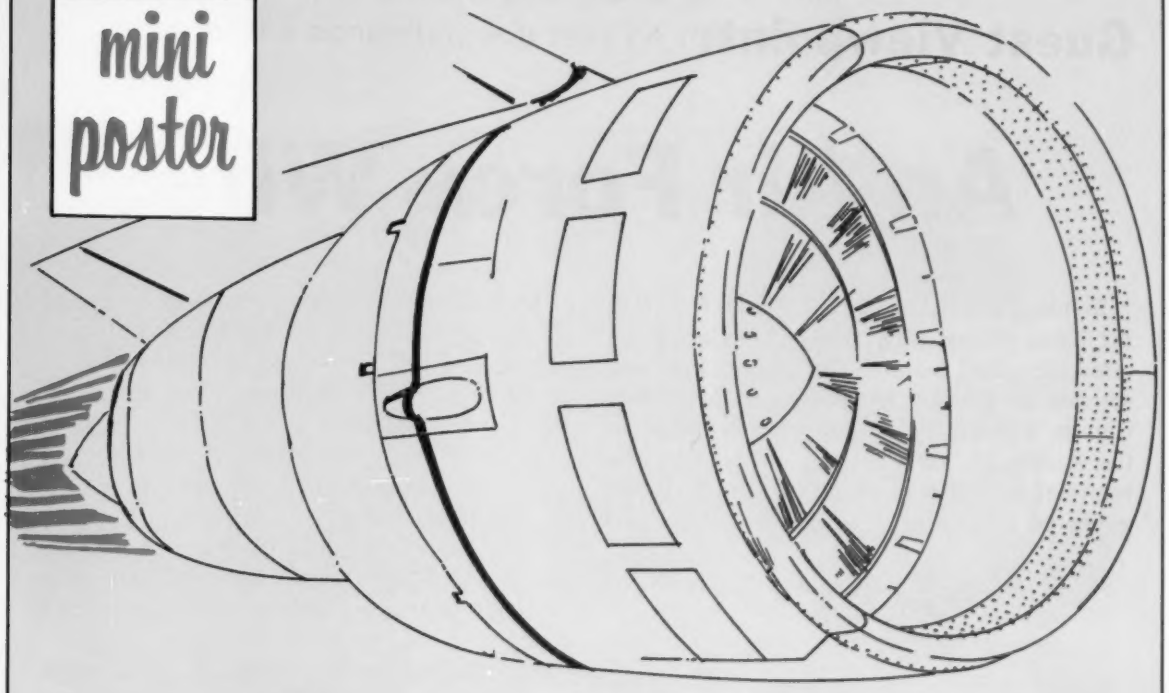
★ A C-141 pilot flight examiner, pleased with his performance data skills, planned a takeoff from an air base in Japan. His takeoff factor was 46.5, and the gross weight was 310,000 pounds. On his arrival at the aircraft, his mental gremlin kept him blissfully unperturbed by the flight engineer's announcement that the anti-skid system was inoperative. (Is it possible the mischief maker erased all thoughts of MACR 57-5, nestled in the pilot's briefcase?)

★ How about this one, flown by a flight crew composed of junior grade commissioned and noncommissioned C. R. Terrors? They took off from a base in Korea in January, when the temperature was a relatively cool —20°F. Their gross weight at that time was 295,000 pounds. As coincidence would have it, these cool cats returned to the same base in August when old sol was bathing the verdant landscape with a balmy temperature of 100°F. When the loadmaster gave the gross weight as 295,000 pounds, they immediately recalled the similarity. Unbelievably, a group gremlin persuaded them to compute only a TRT and rotate speed, and the intrepid heroes gave our allies a few thrills and chills as they groaned off into the wild yonder.

But enough gremlin stories. Summer is with us; it's time to consider the effects that higher temperatures have on aircraft performance. We've all read the hot weather procedures in the Dash One, but how many of us translated the simple statements of fact into cold, hard figures? For instance, if you took off in a C-141 from a 7,000 foot runway last winter, with a 1,000-foot pressure altitude and a temperature of minus 1°C., there was no weight restriction. However, from the same base when the thermometer reads 35°C., your takeoff weight would be limited to 305,000 pounds. The ground run figures are pretty impressive, too . . . at 318,000 pounds in the winter, only 4,800 feet would be needed; however, at 305,000 pounds in the summer, 5,700 feet would be behind you when you lifted into the blue. And this reduced performance doesn't end when you leave the ground. At temperatures above standard, the rate of climb will decrease while climb time, climb fuel, and climb range will increase.

While we could bombard you with figures on performance you probably wouldn't be too enthused abut reading them. So why not try this? The next time you're on a long-range mission and have those boring hours of cruise ahead of you, give your personal gremlin a smart rap. Recompute your takeoff and inflight data based on standard day conditions, and compare those figures to the actual values you're using. The differences may astonish you!

mini poster



Beware of the Blast

If it can push a C-5,

think what it can do to you.

Guest Viewpoint:

An Air Force Wife

Sunday, May 13, is Mother's Day. It is also Air Force Wives' Day, and in that spirit we offer this short feature. The special joys and sorrows of the Air Force wife inspired this tribute, penned by an anonymous author in the Pacific Air Forces. Later released by the Information Office at Bunker Hill AFB, it has appeared in civilian newspapers.

An Air Force wife is mostly girl.

But there are times, such as when her husband is away and she is mowing the lawn or fixing a flat tire on a youngster's bike, that she begins to suspect she is also boy.

She usually comes in three sizes: petite, plump and pregnant. During the early years of her marriage it is often hard to determine which size is her normal one.

She has babies all over the world and measures time in terms of places as other women do in years.

"It was at Wright-Patterson that we all had the mumps . . . In Tokyo, Dan was promoted . . ."

At least one of her babies was born or a transfer was accomplished while she was alone. This causes her to suspect a secret pact between her husband and the Air Force providing for a man to be overseas or on temporary duty at times such as these.

An Air Force wife is international. She may be an Iowa farm girl, a French mademoiselle, a Japanese doll, or a German fraulein. When discussing service problems, they all speak the same language.

She can be a great actress. To heartbroken children at transfer time, she gives an Academy Award performance: "Arizona is going to be such fun! I hear they have Indian reservations . . . and tarantulas . . . and rattlesnakes." But her heart is breaking with theirs. She wonders if this is worth the sacrifice.

An ideal Air Force wife has the patience of an angel, the flexibility of putty, the wisdom of a scholar, and the stamina of a horse.

If she dislikes money, it helps.

She is sentimental, carrying her memories with her in an old footlocker.

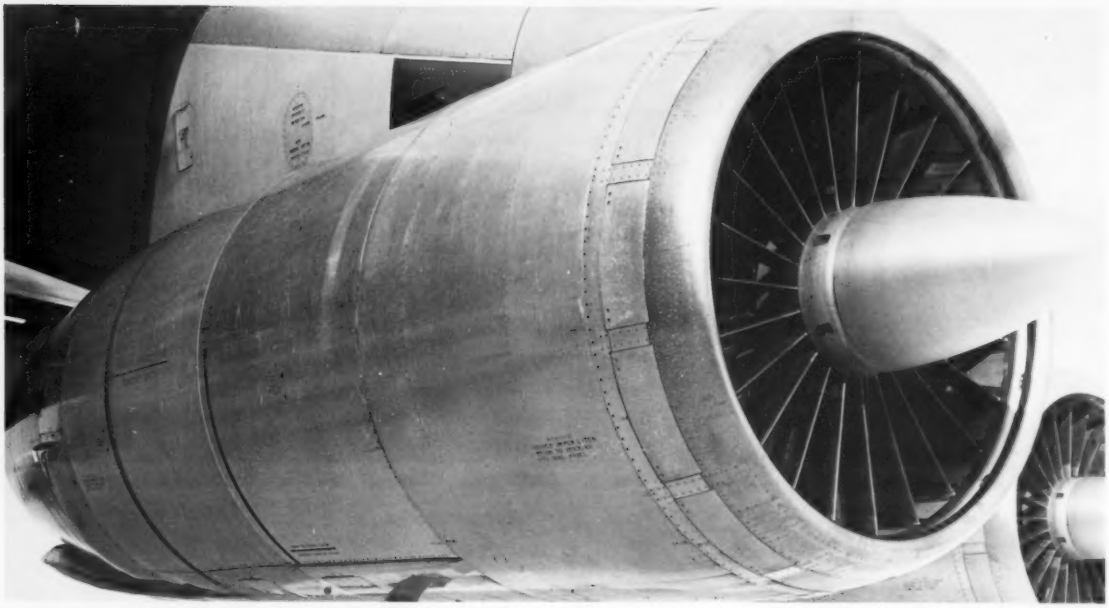
One might say she is a bigamist, sharing her husband with a demanding entity called "duty." When duty calls, she becomes No. 2 wife. Until she accepts this fact, her life can be miserable.

She is, above all, a woman who married an airman who offered her the permanency of a gypsy, the miseries of loneliness, the frustration of conformity, and the security of love.

Sitting among her packing boxes with squabbling children nearby, she is sometimes willing to chuck it all in until she hears the firm step and cheerful voice of that lug who gave her all this.

Then she is happy to be . . . his Air Force wife.

When the airflow gets fouled up in your kerosene converter, you may be the victim of...



Axial Eructation

Pop, bang, chug, snort, buzz!

Sounds like the Fourth of July, maybe — but in this case it's the middle of May and you are winging your way through the wild blue at 35 thou and the attention-getting audible sensations are accompanied with vibrations, fluctuating rpm, and a rapid rise in EGT. These are the symptoms of an engine compressor stall.

Why the noise about compressor stalls? MAC hasn't lost any aircraft due to compressor stalls, have they? No, not yet, but there is a problem.

Problem

MAC is experiencing an unprecedented number of compressor stalls with the TF33 engine on our C-141s. We are losing aircraft capability through air aborts and excessive turnaround times. This is causing mission degradation and an excessive expenditure of maintenance manhours. Maintenance data for recent six-month period reflected 20 aborts, 5,271 component failures, and an additional 4,350 maintenance actions charged to the compressor bleed and anti-ice system. These actions plus the in-shop repair times totaled 44,078 man-hours generated against this system (which is attributed to be causing a large share of our compressor stalls). Two hundred and fifty-two items were condemned and over 1,000 returned to depot because they were not repairable at the local station. What is even more disconcerting is that repeat write-ups were the general rule rather than the exception. This problem has caused head shed concern and action, and a compressor stall conference was recent-

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ly held to determine what should be done to correct the situation.

Many of the conclusions of this conference were directly related to maintenance testing and trouble shooting procedures. But it was agreed that a lack of understanding of compressor stall causes, and the failure to provide complete documentation when writing up stall occurrences, were common discrepancies among crewmembers. The primary factors resulting in TF33 engine stalls are:

1. Malfunctioning bleed system components.
2. Operational characteristics.
3. Internal engine deterioration.
4. Internal engine failures.

These and several other factors have a direct effect on the stall margins of turbojet engines. Stalls may result from a combination of these factors but the pilot can do several things to avoid or reduce compressor stalls.

But before we discuss what the pilot should do, let's look at what happens during a compressor stall and how certain factors affect compressor airflow. The following explanation is adapted from an article in *Flight Safety Facts and Analysis*, April 1972, via Northrop *F-5 Service News*. (Note: Different engines employ various methods of obtaining and controlling compressor performance. Some designs use variable inlet guide vanes while others have bleed air dump systems.) The following discussion attempts to cover compressors in general and should not be interpreted as applying to one specific engine.

Definition

A "compressor stall' is a condition where the pressure rise in the compressor is greater than the compressor is capable of maintaining. When this happens, there is a rapid reduction in airflow velocity through the compressor inlet. This disrupts the normal smooth flow over the low pressure side of the compressor rotor and stator blade airfoils and destroys their lift-producing capabilities. As a result, the airfoil is forced to operate at a high angle of attack and will subsequently stall. The angle at which the air is discharged from the stalled airfoil is altered so that the next airfoil in line will also stall. It is possible that this stall may be confined to a few blades in a limited area of the compressor and will clear itself without corrective action. However, the condition is cumulative and will usually propagate to a sufficiently large number of airfoils to drastically reduce the airflow velocity through the compressor.

This type of stall will produce a flameout or a rapid engine rpm rollback and severe exhaust gas temperature rise. During severe stalls, hot gas from the combustion section can exit forward through the compressor inlet.

There are a number of factors that can contribute to a stall or cause any axial flow turbojet engine to stall. However, it should be remembered that there is one basic reason for the compressor to stall: the compressor has lost its ability to pump a mass air supply through the engine against a high pressure. This normally happens because something has occurred in the inlet duct, combustion, turbine, or variable exhaust nozzle section of the engine, or the bleed air system, or the inlet guide vane schedule to increase the back pressure on the compressor. This increases the compression ratio above the compressor design capabilities.

How the Compressor Works

The basic function of the compressor is to pump a mass air supply through the engine against downstream restrictions and obtain a specific compressor discharge pressure.

This is accomplished by a series of rotor and stator blades, the blades being miniature aerodynamic airfoils similar in design to a cambered aircraft wing. The blades generate lift through the rotation of the compressor and the flow of air through the engine. These miniature airfoils operate high and low pressure zones and are so oriented that the air is progressively compressed as it flows from the front to the rear of the compressor (note figure 1).

The compressor rotor and stator blade airfoil reacts in the same manner as an aircraft wing to changes in angle of attack. The compressor blade relative angle of attack is a function of rotational speed of the compressor blade and the axial flow mach number and density of

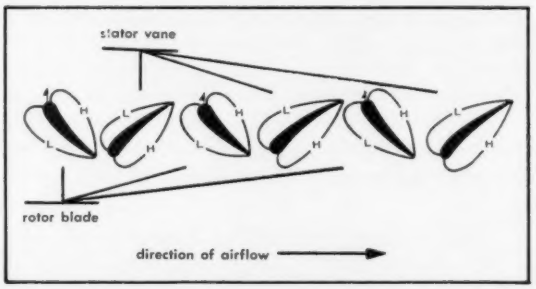


Figure 1. Pressure patterns in the compressor

the air entering the compressor. This is the key to the compressor stall (note figure 2). If the velocity of the air increases, the effective bladę angle of attack decreases, and if the air velocity decreases, the blade angle

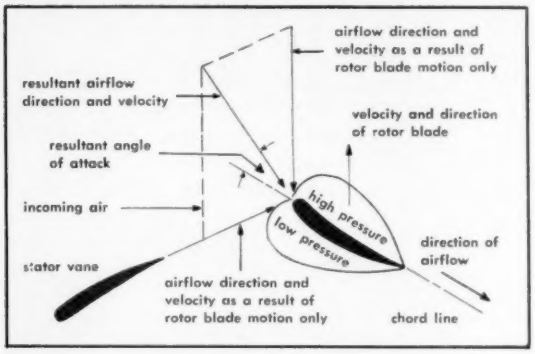

airflow direction and velocity as a result of rotor blade motion only
resultant airflow direction and velocity
velocity and direction of rotor blade
resultant angle of attack
incoming air
high pressure
low pressure
direction of airflow
stator vane
airflow direction and velocity as a result of rotor blade motion only
chord line

Figure 2. Airflow vector diagram

of attack increases. As in the aircraft wing airfoil, an excessive high or low angle of attack will result in unsatisfactory performance (note figure 3). During a compressor stall, the effective blade angle of attack has been so increased by the reduction in airflow velocity through the engine that the blade stalls just the same as the aircraft wing when it reaches the critical angle of attack.

Maximum compressor efficiency requires a constant air velocity through the compressor. Due to downstream restrictions, this rearward flow must also be accompanied by a pressure rise. Since each stage supplies a small amount of the total compression, the air is being gradually compressed. If anything happens to any one stage of the compressor and it loses its ability to pump air, the remaining stages of the compressor will be overloaded and a stall will probably result.

The same amount of air which is drawn in the front must be discharged out the rear at the same instant, regardless of engine speed. Air velocity in the compressor is a function of back pressure, and the back pressure determines compression ratio, and compression ratio affects air velocity and so on. The design objective is to obtain a high pressure rise through the compressor with a minimum of fuel. Therefore, when an engine is operating near its peak efficiency, it is also operating near its stall line for the entire operational region. The engine thrust output is optimized in order to obtain a realistic operational stall margin for the compressor.

Factors Not Controllable by the Pilot

There are five major factors that adversely affect the stall margins of turbojet engines, such as compressor condition, engine trim, fuel control settings, temperature, and altitude.

The condition of the compressor blades, vanes, shroud, variable geometry system, clearance, etc., establish the efficiency of the compressor. Damaged blades, excessive tip clearances, shroud rub, bearing failure, and worn or dirty blades cause loss of efficiency reduction in the overall airflow velocity through the engine.

Cold temperature, rain, hail, or snow increases the density and mach number of the air entering the engine. This increase results in an increase in compressor effectiveness. However, with the pressure rise comes a decrease in air velocity through the engine, the blade angle of attack is increased, and the stall margin decreased.

Altitude effects are more difficult to understand. Variations in atmospheric pressure change the weight flow of air through the engine but do not change the compression ratio, since the inlet pressure and discharge

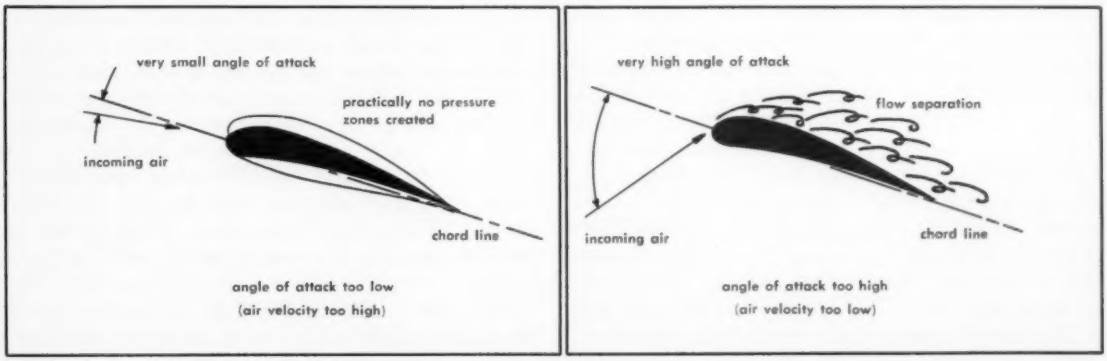


Figure 3. Ineffective angles of attack

Axial Eructation

pressure increase or decrease at the same rate with atmospheric pressure changes. As you recall, air density decreases with altitude, and so does the viscosity of the air. However, the cohesive force of the air does not decrease in proportion with the density. Therefore, at altitude a larger percentage of the available energy provided by the impact forces must be diverted from lift generation in order to move the air across the surface of the blade than is required at sea level.

Because of the relative magnitude of the viscous and dynamic impact forces of the air flowing over the blade airfoil at high altitude, the efficiency of the blade is reduced. The velocity of the air passing over the blade is slowed, the effective angle of attack of the blade is increased, and the stall margin is reduced.

Factors the Pilot Can Control

Yawing, pitching, uncoordinated low-air speed maneuvers, or turbulent air can induce distortion or rapid interruptions of airflow velocity into the engine. These conditions can cause a sudden momentary pressure drop or direction instability at the compressor face causing a stall or flameout. It is possible that the stall will be confined to a few blades and will clear itself. However, if the pressure pulse is severe enough to cause any one stage of the compressor to momentarily stall, the remaining stages of the compressor can become overloaded and stall. If the original cause of the stall is not corrected, this rapid cyclic stall and recovery could recur several times and produce an engine flame-out or severe exhaust gas temperature rise accompanied by pressure surges and vibrations that could be both felt and heard. A similar effect is experienced when ingestion of hot exhaust gas from another aircraft occurs or reingestion of the engine's own exhaust gas takes place. The hot exhaust gas, being less dense than the steady airflow, causes a similar pressure drop across the compressor face.

As mentioned earlier, a slow-speed uncoordinated maneuver will result in a decrease in inlet air velocity, a high blade angle of attack, and a reduction in the fuel-air ratio. Rapidly advancing the throttle adds more fuel to an already fuel-overrich situation. The addition of fuel (heat) at this moment increases the back pressure, which further reduces the velocity of airflow through the engine and increases the blade relative angle of attack. A condition can be reached during an aerodynamic stall where the airflow through the engine is momentarily reversed.

Within the entire combustion section during normal operating conditions, there are about 60 parts of air for each part of fuel (by weight), of which 25 percent is used for combustion and the remaining 75 percent for cooling and other purposes. When the compressor stalls, the airflow through the combustion section is so drastically reduced that the engine flames out or the fuel continues to burn and consumes the airflow intended for cooling: the combustion, turbine, and tailpipe sections then sustain a very severe rise in temperature.

Pilot Procedures

The most important thing a pilot can do to avoid a compressor stall is to handle the throttle with a continuous, smooth movement, and position it slowly and decisively. Always avoid erratic or abrupt throttle movement whether accelerating or decelerating.

If a stall develops, early recognition and corrective action will increase the possibility of a successful recovery and lessen the chance of damage from overtemperature. Let's briefly review the symptoms again. Stalls may be detected by a variety of sounds or compressor pulsations felt through the aircraft structure, loss of thrust reflected through the aircraft instruments, rapid reduction or fluctuations of the rpm at a constant throttle position, failure of rpm to increase during an acceleration, or failure of the engine pressure to increase with an increase of throttle movement. Stalls can range from a mild form which produces no sound or vibration detectable by the crew to one which causes a very loud bang. Generally, a compressor stall will also be accompanied by a rise in exhaust gas temperature.

When a stall is recognized, either by an audible indication or by engine instrument readings, the pilot should attempt to clear the stall by retarding the throttle toward idle until the throttle setting is compatible with engine rpm or until the stall ceases. Then, slowly readvance the throttle until the desired thrust is obtained. Observe the exhaust gas temperature closely and reduce the throttle when necessary to avoid overtemps. Reducing the angle of attack of the aircraft and operating at a higher airspeed may also help to eliminate the stall condition. Coordinated flight will increase the efficiency of the aircraft air-inlet duct and reduce any tendency of the engine to stall. If a stall occurs at high altitude, reduce the altitude, if necessary, to aid stall recovery.

When a stable engine condition is regained, check rpm, fuel flow, EPR, and EGT for normal operation. If normal operation cannot be regained or stall recurs, either shut down the engine or operate the engine below the stall rpm. If the stall cannot be controlled, land as

Improved maintenance procedures will help prevent compressor stalls.

soon as possible since continued operation could cause further damage to the engine.

What Is Being Done?

Several new and improved procedures for checking and maintaining the bleed air system on the C-141 were developed at the MAC compressor stall conference. These will result in changes to technical data and will require some new test equipment for trouble shooting the system. It was also noted that because compressor stalls may result from a combination of items such as malfunctioning bleed valves, faulty fuel flow, improper throttle techniques, dirty engine components, binding or stuck auxiliary air doors (sucker doors), and aircraft attitude and altitude, it is especially necessary for aircrews to be specific and thorough when writing up an engine for compressor stalls. This will help maintenance find and correct the one or more items which may be causing or contributing to the stall.

As disconcerting as a stall may be to the pilot at the time, experience shows there is little chance that serious consequences will result unless internal damage has occurred to the engine. An occasional stall is not reason for concern, but a repeated or continual compressor stall, particularly when violent, can cause component failures in the compressor and hot section of the engine. Therefore, every effort should be made to minimize the period of exposure to conditions which may produce stalls.

Conclusion

As seen by the above discussion there are a number of factors which can affect the stall margins of an engine compressor. Many of these conditions cannot be controlled by the pilot. Others can be. With the improved maintenance procedures and a better aircrew understanding of what causes compressor stalls, the problems MAC is experiencing can be greatly reduced.

Global Notes

air force hero decorated

A highly decorated rescue helicopter pilot is flanked by two former prisoners of war and two of his commanders during an awards ceremony at Scott AFB, IL. Capt Dale E. Stovall, center, wears the three medals — Air Force Cross, the nation's second highest medal, Silver Star, and Air Medal — presented to him by Gen Paul K. Carlton, Commander of the Military Airlift Command. Capt Stovall was presented the Air Force Cross for the rescue of a downed American deep in hostile territory. He flew a Super Jolly Green Giant helicopter into a highly defended area, braving intense ground fire, to successfully recover an F-4 Phantom crewmember. He also received the Silver Star for the rescue of another F-4 crewmember and the Air Medal for recovering eight AC-130 crewmembers. The two returnees, guests of honor at the ceremony, were being processed at the U.S. Air Force Medical Center at Scott.

Left to right: Capt Thomas J. Barrett, returnee of Lombard, IL., Gen Carlton, Capt Stovall, Brig Gen Frank K. Everest, Jr., former Commander of ARRS, and Maj Richard E. Bolstad, returnee of Minneapolis, MN.

award winner

Capt Herbert W. Cullers, Jr., 1550 ATTWg, Hill AFB, UT, received a MAC Outstanding Individual Safety Award for his noteworthy performance during an inflight emergency in an UH-1P helicopter. He successfully coped with an overspeeding engine, thereby averting possible injury to the crew and saving a valuable aircraft.

rescue records

Nearly 1,750 people around the world owe their lives to daring rescue efforts by Aerospace Rescue and Recovery Service (ARRS) aircrews in 1972. While primarily designed to support U.S. military installations, their expertise is available to all nations of the world and to all people — military or civilian. More than 1,270 of the total saves were civilians, and the bulk of those were foreign nationals.

For their combat rescues in Southeast Asia, ARRS personnel have been presented more than 33,000 military awards and decorations since 1964 — including 1 Medal of Honor, 39 Air Force Crosses, and over 600 Silver Stars.

The year 1972 was another rewarding one for ARRS crews. Their feats and accomplishments now total more than 13,000 lives saved in the 27-year history of the command.

controllers save pilot

A team of air traffic controllers at the McGuire AFB Radar Approach Control Facility recently talked-down a civilian pilot caught in bad weather. Sergeants Sheila Dalton (left), David Maddas, John Morrissey, and Staff Sergeant Lawrence Perkins assisted the pilot, Steve Beck of Prospectville, PA, to get through heavy cloud formations. He was not instrument rated and the controllers had to use "common" language and avoid technical jargon to get him down. The entire operation was done without visual contact with the small aircraft. The controllers had only a small blip on a radar screen to work with.

C.R. TERROR

Take an unidentified pax and an obliging AC, mix in a casual security attitude, and you have the ingredients for an unexpected diversion.

Heads up, you aeronuts," quipped the World's Greatest Aviator. "We're going to sneak into Kelly on an ops stop, but we gotta make every minute count. Sergeant Downs, you make sure we offload that 10,000 pounds of trash while Sam and Blinky check with Base Ops and the procrastinating prognosticator. Sergeant Torque, you make sure we have enough go-juice to get us to Charlie Town.

"After you're done, you guys can meet me at Billie's Restaurant for a real Mexican dinner. Man, I can taste those tacos and frijoles refritos now. The only thing we'll be missing is a cold bottle of Lone Star."

"I don't see why you're going to skip the beer, chief," observed Sam. "You've broken the twelve hours from bottle to throttle rule before, so why change your ways? And besides, Doctor Lean, our friendly flight surgeon, said we aren't supposed to eat beans just before flying."

"Look, Sammy, m'boy," whispered C. R., "you can't believe everything those fly docs say. And besides, these frijoles 'fritos are a different breed of animal. They are cooked in clay pots and then refried. Yum, yum, they are magnificento. I've been eatin 'em for years. Right, Blinky?"

Blinky, trying to catch a little oxygen before descent, managed to mumble a distorted, "Right, chief!" through his nose hose and went back to his radar navigation.

"Any questions?" quizzed the Rotund One. "If not, call Houston Center and get us a dive clearance, Sam."

"Okay, sir," replied Sam, "we're cleared to descend and maintain 5,000 feet. Upon reaching five we are to contact San Antonio Approach on 353.5. Hey, shouldn't we slow this beast down a little? You know we do have a red line, not to mention the speed limit."

"Now settle back into your seat, young man," drawled C. R., "you ain't ever heard of anybody getting an ATC ticket for speeding, have ya? That's just for the commercial jocks who think they own the sky. I really don't believe in looking out the window for all those targets nohow, so I want to go past 'em as fast as I can. This cuts the exposure time considerably. You just have to take chances because you can't see 'em all. This is my philosophy and the only realistic approach to the problem. Then if you do have a mid-air collision, you don't die all tensed up."

"Yecch," replied Blinky, "you guys make me shudder talking about midairs; and that philosophy of yours doesn't help the problem. Oh, by the way, sir, my altimeter reads 100 feet below 5,000."

"San Antonio Approach," Sam called, "MAC 50266 at 5,000 requesting radar vector to ILS final at Kelly, over."

"Roger MAC 50266, radar contact, turn right to 220 and descend to 2,500."

Sam had just completed his readback when C. R. tuned in the ACP frequency.

"Hello down there, Kelly APC," belched the Rotund One over the radio. "We are coming in on a wing and a prayer with six empty gizzards. Call Billie's Restaurant and order us six of the super deluxe Mexican plates with a bunch of guacamole salad on the side. We are due to block at 30 with 10,000 pounds of garbage. Got anything for Charlie Town?"

The ACP duty controller nonchalantly replied, "Roger 50266, we have you scheduled for minimum ground time with an onload of 5,000 pounds of explosives for Charleston Naval Station. Actual NEW is 125 pounds. You're going to be running close on your crew duty time. Are you sure you have time to go out to the restaurant?"

"Listen here, young man," snapped Major Terror, "you young punks down there keep forgetting who is running the show. If it weren't for good ACs like me, this whole system would fall apart. We work hard and therefore we do whatever we want, whenever we want. I bet you're not even . . ."

"MAC 50266, San Antonio Approach on guard. If you read come up on 307.0 or 120.3 over."

"Hey, chief!" yelled Sam, "Approach is calling us on guard. With four cotton-pickin' radios in this bird, why'd you have to use U-1 to call ACP? How come you didn't use one of the others so I could monitor Approach?"

"All right, Sam babe," soothed C. R. "Settle down to your normal unexcitable self. Now, what did radar have to say that was so important?"

"We've flown through ILS final approach course and now are cleared to the Kelly VOR for ILS on runway 15," answered Sam.

It wasn't long until C. R. screeched the big Starlifter onto Kelly's jack rabbit-infested runway 15. He was able to turn off at midfield by using max reverse thrust and standing on the brakes. As they rolled up to the parking spot, C. R. cut all four engines and coasted to a stop.

Twenty minutes after touchdown, the World's Greatest Aviator was sitting in the booth anticipating his super deluxe dinner. As he waited, an order of fresh roasted tostados tided him over until the rest of the crew arrived.

"Well, did you cats finally get your work done?" questioned C. R. as he bit into a little jalapena. "I've been waiting here for 15 minutes on you guys but it could have been worse. That cute li'l senorita behind the cashier's desk has been making eyes at me, which helped pass the time. Our food will be ready any time now."

The huge dinners were quickly spread around the table, and the rest of the crew began to enjoy their south of the border cuisine. Then Sgt Downs looked up and spoke to the major.

"Sir, we loaded up that explosive cargo and then had to bump those space available passengers. There is also an Army sergeant who said he was on emergency leave who wants a ride to Charlie Town. I told him to check with pax service, but he said they wouldn't book him because of the explosives. He's going to hang around and talk to you at Base Ops."

"Okay, no sweat," exclaimed the Suave One. "Let's everybody enjoy San Antone's finest product — good food and plenty of peppers."

The hungry fliers quickly polished off the hot food. Not a word of conversation passed until C. R. started making passes at the senorita while the crew paid the check.

As the staff car arrived at Base Ops, the Gross Gripper jumped out and waved to the rest of the crew.

"I'll go check on the pax!" yelled C. R. "You all go on out and start the motors."

As C. R. tore into the Base Ops a young man called, "Senor Major, you are just the man I've

been waiting for. I am trying to get to the east coast, but that selfish man in the passenger service will not let me go. He says you have explosives to carry. I say if it's safe enough for you to haul, it's safe enough for me to ride. Oh, excuse me for not introducing myself. My name is Sergeant Bandito, of the 3d Army Corps."

"Okay," replied the Torridal Tamale Taster, "you're absolutely right. Those guys in pax service try to run the show all the time. Just stick with me and I'll treat you as one of the crew. We haul that stuff around all the time and nothing's ever happened yet."

The big Starlifter made a normal departure and the crew settled down to routine duties as they checked in with Houston Center. About five minutes later the newly acquired passenger, dressed in jungle fatigues, came up to the cockpit. He very carefully pulled a .45 pistol out of his jacket and, placing it to C. R.'s right temple, said, "Senor

Major, I'm very sorry to tell you this, but my whole name is Sergeant Raul Bandito of the 3d Army Corps, People's Liberation Force. Now you will please change your flight plan to Havana, OKAY?"

"Now, now . . . huh, huh, you shouldn't . . . duh . . . Sammy, don't just sit there! Do something!" cried the frightened Fat One, "Get us a clearance to Havana, call ACP, call the MAC command post, call the Texas Rangers, call . . ."

Sam very slowly turned to look at his chief, who still had the big gun touching his temple, and asked, "What do you want me to call them?"

Sergeant Bandito then told the crew that all radios would be turned off. No calls were permitted after Houston Center was informed of the new flight plan.

"Let me put you at ease," said Sgt Bandito. "Once you drop me off, you may proceed without delay to your destination. However, I must get to Cuba immediately. As we approach the airport I will direct you to the drop-off spot."

"No, Sergeant Bandito," replied C. R., sweating profusely. "We can't drop you off at Havana because we don't even carry approach plates for the airport."

"Senor Major," explained the skyjacking sergeant, "you must be confused. I can't land at the airport. I have a parachute in my bag which I plan to use. Please follow my instructions so no one will be hurt. If you fail to do exactly as I say, you and your crew will never see that place, how you call it, 'Charlie Town.' After I jump out over the jungle, you may proceed to your home base."

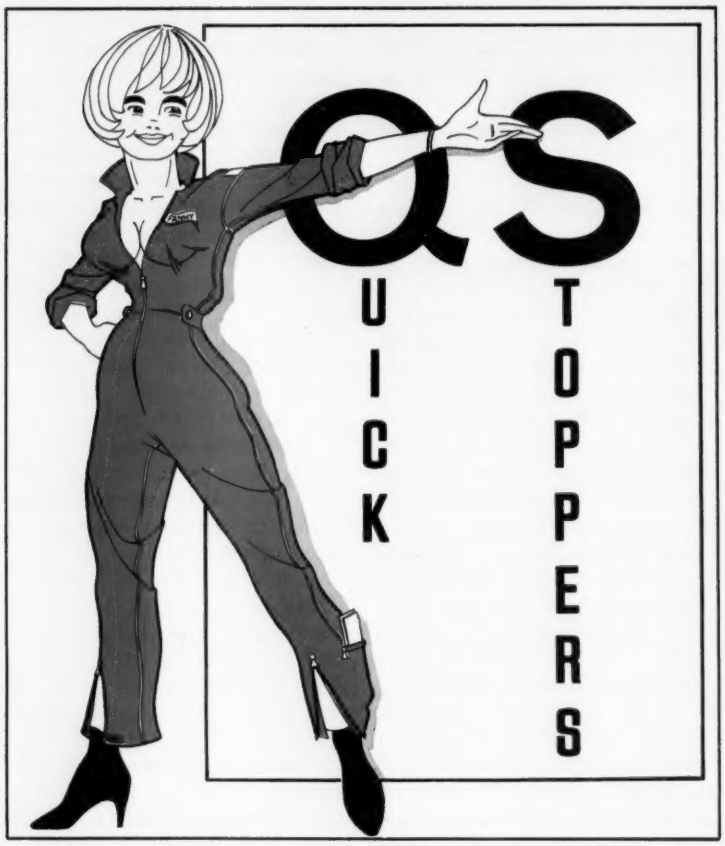
The whole crew relaxed a little and then started preparing for the drop. As C. R. leveled their C-141 at 1,500 feet, the crew depressurized the aircraft and opened one of the troop doors. Sgt Bandito donned his parachute and then directed C. R. exactly where to fly. As they came over the edge of the dense undergrowth the young sergeant jumped out, yelling "Adios, amigos." C. R. immediately shoved the throttles toward the gages and headed for home. The World's Greatest Aviator looked like he'd been swimming in his flight suit.

As the big Starlifter touched down at Charleston, the whole crew, with the exception of the AC, gave a sigh of relief. Maj Terror knew what was coming next. The wing commander, director of operations, safety officer, and C. R.'s friendly squadron commander were eagerly awaiting his arrival.

* * *

"Major Terror," snarled C. R.'s boss, "we started a close watch on you at Kelly when we had a report of complete loss of communications. Later we found out you had just switched the radio channels. If you would get into the practice of listening to the radio yourself instead of having your copilot repeat everything this wouldn't have happened. Next, pax service had a reason for not manifesting that Sergeant Bandito on your flight. Didn't you know about those explosives aboard? Pax service didn't bother checking his leave papers because it was impossible to take anybody on the flight. When this imposter talked to you, you didn't even check the credentials. Then you deliberately ignored 55-1 guidance by taking him as an ACM. Do you realize how much trouble you have already caused and what the consequences could have been if you had landed in an unfriendly country? Well, you bet your sweet gold leaves that it's going to be a long time before you command another flight for me. I hope you are ready to fly cojock for at least six months. Do you have any questions?"

"Well, er, no sir," mumbled C. R. "I just thought you'd be happy because we didn't have to land. After all, we got back safely."



It's Not a Hammer, Dummy!

Did your daddy ever tell you to stop pounding that nail in with the wrench? And did he add that if the wrench was meant to be a hammer it would have a wooden handle?

This message came through loud and clear when a C-141 crew lost number two hydraulic system and had to manually extend the gear. The gear would not lock down so the scanner tried the short pry bar on the stubborn gear. He was unsuccessful because he could not get enough leverage, so he decided to use a longer bar. When he attempted to assemble the long pry bar, he could not do it. Seems someone had used one of the sections as a hammer and jammed the end so that the two pieces would not fit together. Eventually, the gear was locked down using a makeshift pry bar. Would you believe the main landing gear pry bar is not a hammer?

Dust and Stone Tablets

Few things stir up dust like an accident investigation board after an aircraft mishap. They uncover all kinds of discrepancies — and you can bet that the board's recommendations and corrective actions will get things changed. Dash Ones, TCTOs, Ops manuals, local SOPs — you name it, they've all been changed at some time or another because of a bent or broken airplane. But why not stir the dust *before* the accident? That way we won't have to use a broken aircraft as the wooden spoon.

Answer these questions:

★ Are you absolutely sure that all known problem areas on your aircraft and any associated tech orders are really known?

★ Can you think of any items or areas that are not fully understood or need redefining? Have you written any clarification or basic rules covering the confusing items?

★ Have you ever been at happy hour when someone came up with an idea which would improve existing procedures?

Do any of these questions trigger an urge to break out your pen and write somebody a letter or fill out an 847 or an HR? Remember, those guys that write the manuals and Dash Ones don't just climb a mountain and receive a tablet or two from above. They must depend on you to help chisel the stone.

Out of Sight

So you're all checked out in the use of a hand gun? You've had the proper training — how to use it, and clean it, and you know all the safety precautions. But now that you are out of the instructor's sight, you relax and you don't treat your weapon with the respect that it deserves. You become careless and complacent.

Won't happen to me! That's what your flying buddies also say, but here's what was recently observed at one armory while aircrews were being issued and returning their hand guns.

1. Crewmembers smoked during issue and turn-in.
2. There was no supervision during clearing and loading of weapons.
3. Crewmembers crowded around the armory.
4. Crewmembers were wearing and carrying their weapons improperly.

It would be pretty dumb to survive a hairy aircraft emergency only to shoot yourself or a crewmember on the ground. There is only one way to handle any kind of weapon and that is the right way. You've received proper training — now use it.

Light-Pylon Trick

A C-141 crew bought a wing tip when a civilian marshalled them into a tight parking spot. The scanner was looking out the side window using the light triangle from the landing light and the outboard engine pylon as a clearance guide.

After the bash we did a little research and found that the light-pylon trick works only when the landing light is fully extended. So when you retract the lights to aid the marshaller, your little aid is no longer valid.

— *63 MAWg*

Cool Cat

A civilian airline was conducting a training flight for new personnel, and, during the takeoff, the trainee flight engineer noticed suddenly that one of the engines was belching billows of black smoke.

For a moment he was panic-stricken, but he quickly recovered. With the wrench that he had in his hand, he reached out and tapped the pilot on the shoulder.

"We're on fire," he said.

The pilot soon had the plane safely back on the ground. The green engineer was explaining to the ground crew how calmly and coolheadedly he had spotted the trouble, how quietly he had called the pilot's attention to it without panic or excitement. As he was talking, he saw the pilot being carried from the plane on a stretcher.

"What's the matter with him?" the trainee engineer asked.

"Broken shoulder," somebody said.

— *American Airlines FLIGHT DECK*

Belt Yourself

Just a reminder to all our rotor head crewmembers: the gunner's belt (restraining harness) is there to be used. Recently a navy crewman lost his life when the chopper personnel door came open in flight. The crewmember fell out — he did not have his belt on.

Besides disregarding safety directives, you don't show much value for your life if you fail to wear the proper restraining device.

Button Your Lip

Silence is appreciated. We recently ran across an example of communications abuse on HF radios by MAC crews. Seems that our radio speakers were taking an overly generous share of the air time in a highly congested area, and were causing both hard feelings and a potential safety hazard.

Suggestions:

- Save as much radio traffic as possible for transmission when you're in UHF/VHF range.
- Be terse and precise during transmissions.
- Omit all unnecessary transmissions.
- Submit a suggestion or two on simplified communications.

FAA News

FAA is coming out with a change to the Airmen's Information Manual and to the Air Traffic Controllers' Handbooks 7110.8B and 7110.9B. The change is intended to clear up misunderstandings between pilots and controllers. Clarification of "at pilot's discretion" should be of special interest. Here is the change as it will appear in the Airmen's Information Manual.

Clearance General

1. A clearance issued by ATC is predicated on known traffic and known physical airport conditions. An ATC clearance means — an authorization by ATC, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified conditions within controlled airspace. IT IS NOT AUTHORIZATION FOR A PILOT TO DEVIATE FROM ANY RULE OR REGULATION OR TO CONDUCT UNSAFE OPERATION OF HIS AIRCRAFT. PAR 91.3(a) states: "The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft." If ATC issues a clearance that would cause a pilot to deviate from a rule or regulation or in the pilot's opinion would place the aircraft in jeopardy, IT IS THE PILOT'S RESPONSIBILITY TO REQUEST AN AMENDED CLEARANCE. Similarly, if a pilot prefers to follow a different course of action, such as land on a different runway, take off from a different intersection, take off from the threshold instead of an intersection or delay his operation, HE IS EXPECTED TO INFORM ATC ACCORDINGLY. When he requests a different course of action, however, the pilot is expected to cooperate so as to preclude disruption of ttraffic flow or creation of conflicting patterns. *When weather conditions permit, during the time an IFR flight is operating, it is the direct responsibility of the pilot to avoid other aircraft, since VFR flights may be operating in the same area without the knowledge of ATC, and traffic clearances provide standard separation only between IFR flights.*
2. A clearance, information, or request for information originated by an ATC facility and relayed to the pilot through an air/ground communication station will be prefixed by "ATC CLEARS," "ATC ADVISES," or "ATC REQUESTS."

* * *

Adherence to Clearances

5. When air traffic control issues a clearance, pilots are expected to execute its provision after acceptance. Any clearance in which the time of pilot execution is optional will so state — "At pilot discretion." Appending the term "at pilot discretion" to an air traffic control clearance means that air traffic control has offered the pilot the option to initiate the terms of the clearance whenever and however he wishes.

after deadline . . . .

BIG BLOW -- As the sage observed, "There are those who have been involved in a jet blast incident and there are those who will." The crew of a MAC multi-motor, using what they called normal breakaway power, upset a couple of STOL aircraft parked nearby on the ramp and caused a fair amount of damage.

We'll not give our full sermon this time, but just a sermonette. Be very, very careful with the power while taxiing in a congested area.

A HAZARD OR TWO -- According to HRs submitted by aircrews and a recent IG inspection, Teheran/Mehrabad International Airport, Iran, is a very hazardous place to transit. Here are some things you should know prior to filing for there.

* There is no DOD-approved precision approach to the field.

* A serious mid-air potential exists with Iranian fighters practicing touch and go landings while MAC and commercial flights arrive and depart.

* Taxi clearances are established for B737/DC-9 type aircraft, not C-141s, and taxi lines do not assure safe clearance for MAC operations.

* Runways, taxiways, and ramps are extremely slippery when wet.

* MAC crews must deplane wing walkers for all ground operations.

* Aircraft marshallers do not use standard signals.

* The flight crew should be prepared to assist in refueling their aircraft and making sure that it is properly grounded.

* Crews must make sure that the power cart is properly positioned.

* There is a lot of fast-moving, uncontrolled, motor vehicle traffic on the ramp.

* Weather service for down-range stations is not available.

* Be very cautious where you eat. Food poisoning is very common.

HUNG BY THE NECK -- A recent aircraft mishap illustrates the benefits of emergency procedures training. A paratrooper became entangled in his static lines when he jumped from the troop door of a C-141 and was knocked unconscious. The alert flight crew pulled him back into the aircraft with the retriever line, then revived him.

This may be a pessimist's view, but if you expect the worst to happen and are prepared for it, you'll rarely get in trouble when you're flying.

COMING ATTRACTIONS -- The June magazine will highlight operations. There will be several aircraft accident reviews, two navigator-related articles, a helicopter article . . . and good old C. R. Terror.

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